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INTEGRATED OPTICAL DEVICE

Background of the Invention

abandoned,

5 This is a continuation of U.S. Application 10/344,347, which is a national stage entry under 371 of PCT/GB01/03622 filed February 11, 2003., which is based on Great Britain Patent Application No. 0019883.8 filed August 11, 2000, the benefit of which is claimed under 35 U.S.C. 119.

This invention relates to integrated optical devices and their method of fabrication.

10 In the development of optical networks, so-called integrated optical components using waveguides established on a planar substrate are being extensively investigated.

In integrated optical devices, waveguide "cores" are deposited onto a substrate (or more generally onto an undercladding formed on the substrate) and are then covered by an overcladding layer. The refractive indices and other optical properties of the core and cladding materials are set to provide an appropriate waveguiding function. The skilled man will appreciate that terms such as "undercladding", "overcladding", "beneath" and the like are used merely for convenience of the description and do not imply any particular orientation of the device during fabrication or use.

20 A problem which can arise in integrated devices of this nature is that of birefringence. Although the mechanism by which the birefringence arises has not been proven, it is thought to result from differences in thermal expansion properties between layers in the device structures, which cause stresses to build up when the device is cooled after sintering or annealing.

25 Various possible solutions to this problem are summarised, with references, in the paper "Birefringence free planar optical waveguide made by flame hydrolysis deposition (FHD) through tailoring of the overcladding", Kilian et al, Journal of Lightwave Technology Vol. 18, No 2, February 2000. Mostly the previously proposed solutions involve altering the thermal properties of the overcladding, generally to try to match the thermal coefficient of expansion of the overcladding to that of the core, undercladding or substrate. A specific example of this technique is disclosed in US-A-5 930 439. While this aim can be achieved by careful choice of